SEVERE VERTEBRAL COLLAPSE WITH GIBBUS IN A CHILD FROM THE GRAVEYARD OF SÃO MIGUEL CHURCH (CASTELO BRANCO, XIV-XIX CENTURIES):

The present work intends to describe the severe pathological changes affecting the axial skeleton of the specimen number 8, exhumed from the necropolis of the Church of S. Miguel. The diseases that lead to the extensive collapse of the column are of intracranial origin. The majority of the paleopathological literature regarding this type of lesion proposes the diagnosis of spinal tuberculosis (TB) or Pott's disease, nevertheless, the differential diagnosis is challenging. In Portugal there are no convincing TB specimens from archaeological contexts, therefore the identification of this disease may constitute the starting point to trace back the origin and spreading of this (still) dreaded disease.

General context A necropolis situated on the East side of the Church of S. Miguel – presently known as Ed. Catedral.
Location: City of Castelo Branco, the capital of Béira Interior province, Portugal.
Religion: This is one of the most prominent religious spaces of Castelo Branco and is devoted to the Christian cult.
Field work: On the year of 2004 due to structural rehabilitation works on the Church.
Archaeological context 20th anthropomorphic granite rock-cut tombs (Fig. 1). On this campaign were excavated 10 individuals (7 adults and 3 subadults) exhumed from nine graves.
Chronology: According to documentary sources this necropolis, presenting medieval architecture, was used at least from the 14th to the 19th centuries AD.

Case under study: Skeleton number 8 from grave 4 (Fig. 2) a subadult individual with an age at death of 12 years old (±36 months) based on dental eruption and calcification, while the right humeral length (257 mm) points to an age at death of 6 years old.

Pathological findings

Vertebrae
Major deformation collapse of multiple vertebral bodies producing sharply angular kyphosis (around 90°) – gibbus deformity – at the thoracic region (Fig. 3). Slight scoliosis and general absence of bone formation. The radiographic analyses didn’t reveal additional osteolytic foci or other concomitant lesions.

- Bones: T3-T7: totally absent (Fig. 3).
- T1-T2 and T8-T10: flattened with extensive bone resorption and cavities. Sinus tracts and minor signs of bone repair (Figs. 5-6).

- Posterior elements:
  - T2-T8 and T9-T10: ankylosis of the zygapophysial joints.
  - T2-T8: fusion of the laminae.
  - T7-T8: ossification of the interspinous ligaments.

- Neural arches: T9-L1: lodging and porosity with a reticulated (serpentine) appearance extending to the cortex (Fig. 4).

Ribs
Major alterations: abnormal curvature with widening of the rib angle. Thoracic cage with pronounced anterior projection and axially compressed (Fig. 7).
- 8th-9th: bilateral thinning and thickening of the neck.
- 8th-9th: the articular surfaces of the vertebral ends are symmetrically destroyed with irregular bone formation.
- 8th downward: enlargement of the vertebral ends detected on both sides.

Clavicles
- narrowling of the lateral third of both clavicles.

Overall
The changes on the ribs morphology correlate with those at the vertebral column, especially on the middle/inferior portions of the thoracic segment.

Discussion

Major destruction of the vertebral columns exerts a panoply of pathological conditions that should be pondered as diagnostic possibilities.

Non-infectious diseases, namely neoplasms and trauma, fungal diseases or infectious conditions like brucellosis and actinomycosis, are the less likely causative factors. This assumption relies on the severity of the vertebral deformities, and also on the typology, pattern of distribution and extension of the lesions [1].

Pyogenic or tuberculosis spondylitis are more compatible diagnostic options. Despite modern clinical studies emphasize that the imaging features of tuberculous spondylitis may resemble those seen in pyogenic infection [10], there are paleopathological signs that may allow their differentiation:

1. The young age of the ak. It is in accordance with the paleopathological literature stating that in past times spinal tuberculosis (TB) was frequent on children [4, 8, 15].
2. The presence of sinus tracts is reported as a common complication of spinal tuberculosis [12].
4. The osteolytic lesions of the vertebral posterior elements may occur in both processes [14] but it has been reported to occur more often in tuberculous spondylitis and rarely encountered in pyogenic infections [12].
5. One of the paleopathological and clinical hallmarks leading to the diagnosis of skeletal TB is spinal angular kyphosis (4, 5, 10) – the most prominent feature of our case. It must be noticed, however, that there are clinical studies [11] reporting patients with non-tuberculous bacterial infections also presenting involvement of multiple vertebral bodies and "true vertebro-lumbar collapse with resulting gibbus deformity" [13].

One cannot neglect the importance of making an etiology, although with caution, between published ancient TB specimens or modern clinical evidence. Similar morphological features to those herein described are documented extensively on the paleopathological literature [4] with spinal TB as the most probable etiology. Thus, based on paleopathological criteria and the above mentioned aspects of clinical evidence, the underlying pathological changes of the subadult number 8 fits a probable diagnosis of spinal TB. This individual represents the most striking case of vertebral destruction and probably the first specimen of Pott’s disease from the Portuguese archaeological record.